3-17.55 35 ERESTING PATENT MATERIAL ON SUCTION SOCKETS

Dubois D. Parmelee February 10, 1863
...ing the bucket A of an artificial limb to the stump by means of atmospheric pressure, substantially in the manner specified."....

Reissue No. 1,907 Dubois D. Parmelee March 21, 1865
..."1. Fastening the bucket or artificial limbs to the stump by means of atmospheric pressure substantially in the manner specified.
2. The adjustability, by the means herein described, or by means substantially the same, of the limb with respect to length, as set forth."....

Reissue No. 1,908 Dubois D. Parmelee March 21, 1865
..... "The principal advantages of my artificial limb are that it can be fastened to the stump without the use of straps around the waist or shoulder, and it requires not tedious fitting; but I desire it to be understood that I do not confine my invention as applied to buckets made to be attached to the stump by atmospheric pressure, but I deem it a valuable invention in connection with any artificial limb, of whatsoever construction, as facilitating, expediting, cheapening, and rendering more perfect the construction of buckets.

Having now fully described my said invention, what I claim as new, and desire to secure by Letters Patent, is---

1. The method of making the bucket of artificial limbs of a plastic substance capable of being subsequently indurated upon a mold or cast of the stump, in the manner and for the purpose set forth.
2. Shaping the interior of buckets when made of a substance rendered plastic by heat by means of a core, which is the fac-simile of the stump, in combination, with the requisite degree of heat, substantially in the manner and for the purpose set forth.
3. The manufacture of artificial limbs, with buckets of hard rubber or vulcanite, or its equivalent, for holding the stump, substantially as described."....

Patent No. 329,880 George Beacock & Terence Sparham November 10, 1885
..."6. In an artificial limb, an air-chamber provided with a valve, substantially as specified"....

Patent No. 980,457 Justin Kay Toles January 3, 1911
..."5. In an artificial limb, in combination, a shell, a sack formed of elastic material and placed within the shell, a valve in said sack, a sheath formed of non-distensible material inclosing said sack, said sack and sheath being connected together at their upper and lower ends, means provided on said sheath near its lower end for allowing a limited downwardly movement thereof, and means for drawing downwardly the lower ends of both sack and sheath.

Patent No. 1,586,015 Ernest Walter Underwood January 14, 1926
..... "To avoid this difficulty I believe an attempt was made some years ago to secure the limb to the stump by the use of suction, the bucket or socket portion of the limb being smooth and arranged to form an air chamber, but I believe the attempt was unsuccessful. In any case previously it has been proposed to

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provide such an air chamber with a valve for admitting air into the chamber to relieve the suction and permit the withdrawal of the limb.

"In my own case I have tested sockets depending on suction alone in this manner without success, and the object of my invention is to provide an artificial limb having a valved suction chamber of the character described in which accidental detachment and the risk of chafing or injuring the stump will be obviated and a healthy condition of the limb will be promoted.

Accordingly, my invention consists in a limb having a suction chamber in the socket or bucket in which a smooth helical groove or grooves is formed in the interior of the bucket so that the limb is easily applied to the stump and is held very effectively thereon.

..... The internal dimensions and length of the socket will of course be determined by the dimensions of the stump for which it is intended. An air release valve e is employed in the socket to allow air to escape therefrom as the stump is inserted; and to permit air to be admitted thereto when the stump is withdrawn....

The valve employed in the socket is preferably an ordinary spring-seated valve e. It has a stem or plunger projecting thru the wall of the socket and a head having a resilient or other suitable sealing face for closing against an internal seating. Around the stem a light compression spring is arranged so that the valve is closed automatically by the spring, but can be opened by finger pressure applied to the plunger or stem.

The grooved socket should not be a deadtight fit upon the stump, but should be a free fit so that the stump can find its way easily practically to the bottom of the bucket. As the grooved socket is placed over the stump, the latter finds its way into the socket if the valve is depressed to relieve the air. The muscles of the stump cause it to expand into the groove or grooves when the patient is standing or walking, but permit it to be contracted so that air may enter around the groove or grooves to ventilate the stump when the patient so desires.

By the use of the invention the stump is developed and exercised and a healthy condition results.

What I claim is:-

... 1. An improved artificial limb including a hollow socket for the reception of the stump of the patient's limb, said socket being constructed of comparatively rigid material and closed at its lower end and being formed with a helical groove in the internal surface thereof.

....2. An improved artificial limb including a hollow valved socket for the reception of the stump of the patient's limb, said socket being constructed of comparatively rigid material and closed at its lower end and being formed with a helical groove in the internal surface thereof,

... 3. An artificial limb including a wooden socket closed at its lower end and provided with a continuous groove in a portion of the internal wall." . . . . . .